CLAIMS

Therefore, having thus described the invention, at least the following is claimed:
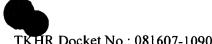
1   1.   A distributed data monitoring and control system suitable for residential

2   automation applications, comprising:

3   at least one sensor suitably integrated with a residential system configured to

4   provide a sensor data signal;

5   at least one wireless communication device communicatively coupled with the at

6   least one sensor configured to receive the sensor data signal and format a first encoded

7   data signal comprising a communication device identifier and a predetermined function

8   code responsive to the received sensor data signal wherein the wireless communication

9   device broadcasts the first encoded data signal over a wireless transmission media to a

10   gateway communicatively coupled to a wide area network configured to receive and

11   translate the first encoded data signal into a wide area network data transfer protocol for

12   transmission to a computing device configured to collect, process, and store, the received

13   sensor data signal.

1   2.   The system of claim 1, wherein the at least one wireless communication

2   device is configured to broadcast the first encoded data signal via a transmission medium

3   selected from the group consisting of radio-frequency (RF), infra-red (IR), and

4   ultrasound.

1   3.   The system of claim 1, wherein the at least one wireless communication

2   device broadcasts the first encoded data signal to a computing device configured to

3   execute a computer program having a first segment for evaluating the first encoded data

4   signal to identify the at least one wireless communication device.

1   4.   The system of claim 1, wherein the at least one wireless communication
2   device broadcasts the first encoded data signal to a computing device configured to
3   execute a computer program having a second segment for evaluating the first encoded
4   data signal to identify a parameter value associated with the sensor.

1   5.   The system of claim 1, wherein the at least one wireless communication
2   device is configured to receive a second encoded data signal via a transmission medium
3   selected from the group consisting of radio-frequency (RF), infra-red (IR), and
4   ultrasound.

1   6.   The system of claim 1, wherein the gateway is configured to insert timing
2   information into the first encoded data signal.

1   7.   The system of claim 1, wherein the gateway is configured to translate the
2   first encoded data signal into TCP/IP for communication over the wide area network.

1   8.   The system of claim 1, wherein the wide area network is the Internet.

1   9.   The system of claim 1, wherein the wide area network is an Intranet.

1   10.   The system of claim 4, wherein the computer program uses a look-up table
2   that associates at least one parameter value associated with the sensor to a data input.

1   11.   The system of claim 4, wherein the at least one wireless communication
2   device broadcasts the first encoded data signal to a computing device configured to
3   execute a computer program having a third segment for evaluating the relative health of
4   the at least one wireless communication device.

1   12.   The system of claim 5, wherein the second encoded data signal originates
2   from a closely located second wireless communication device associated with at least one
3   sensor and identifies a parameter value associated with the associated sensor.

1   13.   The system of claim 5, wherein the at least one wireless communication
2   device is configured to generate and broadcast a composite encoded data signal
3   comprising information from the first and second encoded data signals.

1   14.   The system of claim 11, wherein the computer program evaluates the
2   relative health of the at least one wireless communication device based on an algorithm
3   that monitors elapsed time between received first encoded data signals.

1   15.   The system of claim 13, wherein the at least one wireless communication
2   device is in communication with an actuator and is configured to receive an encoded
3   command signal generated by a computing device configured to execute a computer
4   program responsive to the received sensor data signal.

1   16.   The system of claim 15, wherein encoded command signals are routed in
2   response to the previously identified wireless communication device(s) responsible for
3   generating and forwarding an associated received sensor data signal.

1   17.   The system of claim 15, wherein the actuator is responsive to a received
2   command signal.

1   18.   The system of claim 15, wherein encoded command signals are routed
2   periodically to the at least one wireless communication device to initiate a sensor data
3   signal.

1   19.   The system of claim 15, wherein encoded command signals are routed
2   periodically to the at least one wireless communication device to initiate a wireless
3   communication device health check response signal.

1   20.   The system of claim 15, wherein encoded command signals contain
2   encoded audio broadcast messages.

1   21.   A method for monitoring residential systems, comprising:
2   providing at least one gateway device in communication with a wide area network
3   wherein the gateway device is configured to receive an encoded broadcast signal having a
4   first portion that identifies an originating wireless communication device and a second
5   portion that contains a function code responsive to a sensed parameter;
6   using the gateway device to translate and embed the received broadcast signal
7   within a data packet with a network data transfer protocol;
8   using the gateway device to transmit the data packet over the wide area network to
9   a designated computing device;
10   receiving the data packet at the designated computing device; and
11   using the designated computing device to identify the originating wireless
12   communication device and the associated function code contained within the data packet.

1   22.   The method of claim 21, wherein the step of providing the at least one
2   gateway device is accomplished by communicatively associating the gateway with the
3   Internet.

1   23.   The method of claim 21, wherein the step of providing the at least one
2   gateway device is accomplished by communicatively associating the gateway with a
3   dedicated Intranet.

1   24.   The method of claim 21, wherein the step of using the gateway device to

2   translate and embed the received broadcast signal in a data packet is accomplished with

3   terminal control protocol / Internet protocol (TCP/IP).

1   25.   The method of claim 21, wherein the step of providing the at least one

2   gateway device is accomplished with a gateway device in communication with at least

3   one wireless communication device configured to broadcast an encoded broadcast signal

4   via a transmission medium selected from the group consisting of radio-frequency (RF),

5   infra-red (IR), and ultrasound.

1   26.   The method of claim 21, further comprising:

2   using the designated computing device to associate timing information responsive

3   to the received broadcast signal;

4   storing parameter information derived from the function code; and

5   providing access to the stored parameter information upon client request.

1   27.   The method of claim 21, wherein the step of providing access to the stored

2   parameter information is accomplished using a web browser.

1   28.   The method of claim 27, wherein the step of providing access to the stored

2   parameter information is accomplished using hypertext mark-up language (HTML).

1   29.   The method of claim 27, wherein the step of providing access to the stored

2   parameter information is accomplished using at least one graphical user interface.

1   30.   A method for monitoring and controlling residential systems, comprising:

2   providing at least one gateway device in communication with a wide area network

3   wherein the gateway device is configured to receive a first encoded signal having a first

4   portion that identifies an originating wireless communication device and a second portion

5   that contains a function code responsive to a sensed parameter and wherein the gateway

6   device is configured to broadcast a second encoded signal that identifies at least one

7   wireless communication device to traverse ending at a destination wireless

8   communication device and wherein the second encoded signal contains a command;

9   using the gateway device to translate and embed the received broadcast signal

10   within a data packet with a network data transfer protocol;

11   using the gateway device to transmit the data packet over the wide area network to

12   a designated computing device;

13   receiving the data packet at the designated computing device;

14   using the designated computing device to identify the originating wireless

15   communication device and the associated function code contained within the data packet;

16   deriving parameter information from the function code;

17   generating at least one command in response to the derived parameter

18   information;

19   embedding the command information and appropriate wireless communication

20   device routing information in a data packet;

21   transmitting the data packet to the appropriate gateway; and

22   using the gateway to construct an appropriate second encoded signal responsive to

23   the data packet.

1   31.   The method of claim 30, wherein the step of providing the at least one

2   gateway device is accomplished by communicatively associating the gateway with the

3   Internet.

32.   The method of claim 31, wherein the step of providing the at least one gateway device is accomplished by communicatively associating the gateway with a dedicated Intranet.

33.   The method of claim 31, wherein the step of using the gateway device to translate and embed the received broadcast signal in a data packet is accomplished with terminal control protocol / Internet protocol (TCP/IP).

34.   The method of claim 31, wherein the step of providing the at least one gateway device is accomplished with a gateway device in communication with at least one wireless communication device configured to broadcast an encoded signal via a transmission medium selected from the group consisting of radio-frequency (RF), infra-red (IR), and ultrasound.

35.   The method of claim 31, further comprising:
        using the designated computing device to associate timing information responsive to both the first and second encoded signals;
        deriving parameter information from the function code;
        using the parameter information in a control algorithm to derive system outputs;
        providing the system outputs upon client request.

36.   The method of claim 31, wherein the step of providing system outputs is accomplished using a web browser.

37.   The method of claim 36, wherein the web browser uses hypertext mark-up language (HTML).

38.   The method of claim 36, wherein the web browser uses at least one graphical user interface.